Satellites and Orbits: an Introduction

Teacher Instructions

Summary: Prior to beginning the teaching session, print the teacher instructions, reading assignment, classroom demonstration instructions, quiz, and at least one copy of the glossary. Hand out the pre-class reading assignment prior to the classroom presentation portion. Conduct the browser based presentation. The presentation contains two activities: a classroom demonstration and a student lab. These are clearly noted on-screen at the appropriate time. The classroom presentation contains an optional section titled "Terminology Used to Describe Orbits". This section is slightly more advanced, so use your own judgment in determining that it is appropriate to continue for your class. The last activity is the quiz.

Step 1: Print Supplemental Materials

With your preferred browser, open the file named
http://eic.ipo.noaa.gov/IPOarchive/ED/k-12/IPO/unit01/satellitesAndOrbits.html
Click on the Contents button at the bottom of the screen.
Midway down the page you will see the following heading: *Materials to Print*.
Click each link open or download the following documents:

http://eic.ipo.noaa.gov/IPOarchive/ED/k-12/IPO/unit01/teacher_instructions.doc
http://eic.ipo.noaa.gov/IPOarchive/ED/k-12/IPO/unit01/student_reading_assignment.doc
http://eic.ipo.noaa.gov/IPOarchive/ED/k-12/IPO/unit01/satellites_and_orbits_glossary.doc
http://eic.ipo.noaa.gov/IPOarchive/ED/k-12/IPO/unit01/classroom_demonstration.doc
http://eic.ipo.noaa.gov/IPOarchive/ED/k-12/IPO/unit01/satellites_and_orbits_quiz.doc

Step 2: Hand out pre-class reading assignment to students.

Step 3: Preparation. (Time required -1 hour)

Gather and prepare materials for the classroom presentation. (see *classroom_demonstration.doc*)
Familiarize yourself with the classroom presentation.
The controls for the presentation consist of a forward and back button. Simply click the small arrows at the bottom of the screen. The Right Arrow button advances to the next screen. The Left Arrow returns to the previous screens. You may also use the Left and Right arrows on your keyboard in lieu of the mouse.

The presentation contains several animated sequences. Some of these may take several seconds to complete. It will be up to you to pause long enough to allow them to complete. Questions are posed for classroom participation at various points. You may want to note these during your review of the material.

Step 4: Conduct the presentation portion.

The Macromedia Flash player is required for the classroom presentation. You can download it free from http://www.macromedia.com.
Depending upon your situation, you can conduct the presentation to a small group or allow the students to do it themselves with each student (or group) at their own computer.

Using a web browser, open
http://eic.ipo.noaa.gov/IPOarchive/ED/k-12/IPO/unit01/satellitesAndOrbits.html.
Or if you have a CD, locate the file: *satellitesAndOrbits.html* on the CD and open it.

Once the movie loads:

Engage: Click the RIGHT ARROW once to advance past the title screen to the opening animation. You will see a looping animation of an artist's concept of a satellite orbiting Earth. Ask the students the following questions:

–What do you think is happening in the animation?

–What is the object that moves across the screen?

Continue to *Classroom Demonstration 01*.

Explore: Conduct classroom demonstration to simulate gravity. (see classroom_demonstration.doc) Depending on your situation, you can do this activity as a teacher demonstration or as a student activity. If done as a student activity, you may want to go outdoors.

Continue to Student Lab 01 - Why Don't Satellites Fall From the Sky? This is an on-line activity. All instructions are provided at the Internet site. Instruct students to point their browsers to http://www.fearofphysics.com/Satellite/satellite.html and do the activity.
Allow some time for each student (or small groups) to complete the activity. It is kind of tricky but the information required to complete the exercise successfully has been presented.

Engage: Allow discussion of the experience, who was successful, and what they learned.

Continue the classroom presentation to the section titled *Terminology Used to Define Orbits*. You can end at this point or continue through the slightly more advanced section.

Conduct the quiz at the end of the session. (see *satellites_and_orbits_quiz.doc*)